

Appl. No. 10/532,563
Amdt. Dated February 1, 2010
Reply to Office action of September 30, 2009

REMARKS

Claims 1-10 are pending in the instant application. Claim 10 stand rejected under 35 USC §101 and 112. Claims 1-10 stand rejected under 35 USC 103 as obvious over United States Patent No. 6,466,814 to Ardenkjær-Larsen et al. The application has been amended. The claims have been amended. Specifically, claim 10 has been canceled. Applicant respectfully submits that none of the amendments constitute new matter in contravention of 35 U.S.C. §132. Reconsideration is respectfully requested.

Claims 1-10 stand rejected under 35 USC 103 as obvious over Ardenkjær-Larsen et al, US6,466,814. The rejection is respectfully traversed.

The present invention is directed to obtaining hyperpolarized ^{129}Xe with a high level of polarization. ^{129}Xe is a rather lipophilic compound and it is favourable to use a lipophilic solvent to properly dissolve ^{129}Xe in the solvent. Hence, it has been found that the property of the solvent is critical for success of the polarization process. Further, it is favourable if the mixture of ^{129}Xe and solvent does not form crystals upon freezing (DNP is carried out at very low temperatures and the sample to be polarized is thus frozen). If crystals are formed, the contact between the free radical and the compound to be polarized is suboptimal and thus the transfer of polarization from the unpaired electron radical to ^{129}Xe is suboptimal as well, resulting in a lower polarization level. This can be avoided by using a solvent which is a good glass former, i.e. which does not crystallize upon freezing. Hence, in the method of the present invention it is critical that xenon, which is to be hyperpolarized, is mixed with the solvent, or mixture of solvents, before hyperpolarisation as a purpose of the solvent is to

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avoid formation of crystals upon the hyperpolarisation by DNP and thus obtaining a high level of polarization. Further, it is critical that the solvent has the right properties to avoid such formation of crystals, i.e. that the solvent has good glass-forming properties and/or lipophilic properties.

Ardenkjær-Larsen (US 6,466,814) discloses a method of MR investigation including producing a hyperpolarized solution of a high T1 agent. A solid sample of the T1 agent is hyperpolarized and then dissolved in a physiologically tolerable solvent. According to Ardenkjær-Larsen any solvent that is tolerated by the human or non-human animal body, e.g. water, aqueous solutions and perfluorocarbons may be used (column 3, lines 5-9). The invention of Ardenkjær-Larsen hence provides a method for producing a hyperpolarized solution from a hyperpolarized solid sample of an agent exhibiting a long T1 relaxation time. In one aspect, Ardenkjær-Larsen suggests that the hyperpolarized solid sample retains its polarization when transported in a magnetic field and at low temperature, and in this way the agent can be hyperpolarized at a site remote from its end use and transported to its place of use in a magnetic field and at a low temperature and there/then dissolved and administrated (column 3, lines 9-15).

Hence, Ardenkjær-Larsen does not disclose the use of a solvent or a mixture of solvents, wherein such solvent has good glass-forming properties and/or lipophilic properties. Further, the applicant disagrees that it would be obvious to modify the order of the addition of the solvent in the process of Ardenkjær-Larsen, as the purpose of using the solvent is different for the two inventions. Ardenkjær-Larsen uses the solvent simply to dissolve the

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hyperpolarized solid sample before administration to a body. However, in the present invention the solvent is used as an additive in the DNP hyperpolarization of xenon in the solid state and this can dramatically increase polarization enhancement. Hence, as Ardenkjær-Larsen is silent about using a solvent with good glass-forming properties and/or lipophilic properties and as it is not obvious to one of ordinary skill in the art to modify the order of addition of solvent of Ardenkjær-Larsen Applicant finds that claims 1-9 are inventive over Ardenkjær-Larsen. Reconsideration and withdrawal of the obviousness objection is respectfully requested.

In view of the amendments and remarks hereinabove, Applicant respectfully submits that the instant application, including claims 1-9, is in condition for allowance. Favorable action thereon is respectfully requested.

Any questions with respect to the foregoing may be directed to Applicants undersigned counsel.

Respectfully submitted,

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